

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

TruePosition, Inc.,)	
)	
Plaintiff/)	
Counterclaim-Defendant,)	
)	Civil Action No. 05-747-SLR
v.)	
)	
Andrew Corporation,)	REDACTED VERSION DI 212
)	
Defendant/)	
Counterclaim-Plaintiff.)	
)	

**APPENDIX A
MEMORANDUM IN SUPPORT OF TRUEPOSITION'S MOTION TO
EXCLUDE THE TESTIMONY OF DR. DEWAYNE E. PERRY
PURSUANT TO FEDERAL RULE OF EVIDENCE 702**

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APPENDIX A

TO

**MEMORANDUM IN SUPPORT OF
TRUEPOSITION'S MOTION TO EXCLUDE THE
TESTIMONY OF DR. DEWAYNE E. PERRY
PURSUANT TO FEDERAL RULE OF EVIDENCE
702**

A88 – A184

***** FILED UNDER SEAL *****

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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TRUEPOSITION, INC.,

Plaintiff and Counterclaim Defendant,

v.

ANDREW CORP.,

Defendant and Counterclaim Plaintiff.

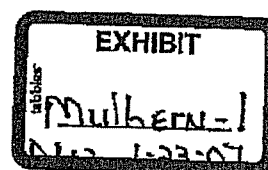
Case No. 05-0747-SLR

Confidential
Subject to Protective Order

EXPERT REPORT OF CARLA S. MULHERN

DECEMBER 1, 2006

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I. INTRODUCTION

A. Assignment

1. I, Carla S. Mulhern, submit this expert report on behalf of TruePosition, Inc. ("TruePosition") in the above-captioned case. I have been retained by TruePosition to provide expert analysis and testimony related to the damages that have been sustained by TruePosition assuming that Andrew Corporation ("Andrew") is found to have infringed U.S. Patent No. 5,327,144 ("the '144 patent"), issued on July 5, 1994 and entitled "Cellular Telephone Location System."¹
2. For purposes of my analysis, I have been asked to assume that the patent-in-suit is valid, enforceable and infringed by Andrew. As part of my assignment, I have been asked to examine whether TruePosition may be entitled to lost profits damages and, if so, to quantify such damages. In particular, I was asked to evaluate lost profits regarding potential sales to Saudi Telecom Corporation ("STC") and Q-Tel in Qatar. I may also be asked to respond to opinions set forth by experts retained on behalf of Andrew.

B. Summary of Conclusions

3. In the event that Andrew is found liable for infringement of the '144 patent, my analysis of the *Panduit* factors as set forth below indicates that TruePosition is entitled to lost profits damages resulting from Andrew's infringing sales of GeometrixTM ("Geometrix")

¹ TruePosition's Second Amended Complaint for Patent Infringement (May 30, 2006); U.S. Patent No. 5,327,144.

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systems to a Saudi Arabian cellular carrier, STC,

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4. I have analyzed TruePosition's damages associated with Andrew's sales to STC under two alternative scenarios. The first scenario assumes that, in the event of a finding of liability, Andrew will not be required to cease its sales of the allegedly infringing systems to STC that are already in progress and that Andrew will be awarded the STC full kingdom-wide roll out.³ In this scenario, I calculate lost profits to TruePosition associated with the kingdom-wide roll out to STC.

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² My review of the available evidence indicates that Andrew's offers to provide Geometrix hardware, software and services to each of these cellular carriers displaced TruePosition. To the extent that additional information becomes available, I may be asked to update my opinions accordingly.

³ Deposition of Joseph Kennedy, Jr., 10/17/06, Vol. I, pp. 75-76 and Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule-30(b)(6) - Vol. 2, pp. 42-43.

⁴ STCRFP_FinalPricing_12.07.04.xls, at 2.6.1.3. These prices are consistent with the prices in TruePosition's May 2005 bid. See STC_PricingUpdate_05.02.05_TP.xls.

⁵ Exhibit 1.

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5. The second lost profits scenario assumes that, in the event of a finding of liability, Andrew will be prevented from making any additional sales of the allegedly infringing Geometrix system.⁶ In this scenario, I calculate the net present value of the lost profits to TruePosition associated with the displacement of TruePosition by Andrew's infringing sales to STC that have occurred to date, i.e., Phase I and Phase II.⁷

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⁶ This scenario also assumes that the Andrew equipment already installed at STC pursuant to Phases I and II of the contract will remain in place. There is some evidence that the Andrew and TruePosition equipment could co-exist with each other albeit in different locations. Deposition of Joseph Sheehan, 11/17/06, [ROUGH, pp. 83-87]. See also TPI-E0017654, p. 11.

⁷ The evidence indicates that Andrew expects to make additional sales to STC. Deposition of Gary Brown, 11/7/06, Vol. I, p. 116. See also, Deposition of Joseph Kennedy, Jr., Third Rule – 30(b)(6) – Vol. 2, 11/9/06, pp. 68-69. To the extent that additional information regarding such sales becomes available prior to trial, I may be asked update my calculations accordingly.

⁸ Exhibit 1.

⁹ PX-26.

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7. As the allegedly infringing activities of Andrew are ongoing, the magnitude of Andrew's actual and/or expected infringing sales at the time of trial may be different from those contemplated in the analysis set forth here. For example, my review of the recent deposition of Joseph Sheehan, TruePosition's President and Chief Operating Officer, indicates that there is some possibility that TruePosition may be awarded some portion of the business at STC in future.¹⁰ In that event, I may be asked analyze potential financial injury to TruePosition in the form of lost profits due to price erosion, increased costs, and/or the costs of delay. Therefore, I reserve the right to update my calculations to reflect additional information as appropriate.

C. Qualifications

8. I am a Managing Principal at Analysis Group, Inc. ("Analysis Group"). Analysis Group provides economic and financial analysis for complex litigation, regulatory proceedings, and corporate strategic planning. Analysis Group maintains offices in Boston, Massachusetts; Dallas, Texas; Denver, Colorado; Chicago, Illinois; Los Angeles, California; Menlo Park, California; Montreal, Quebec; New York, New York; San Francisco, California; and Washington, DC.

¹⁰ TruePosition has submitted two proposals for location-based services solutions to STC since October 2006. See Deposition of Joseph Sheehan, 11/17/06, [ROUGH, pp. 85-88].

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9. I am an economist whose specialty is intellectual property valuation and monetary relief assessment. I have been involved in numerous such engagements spanning a broad range of industries, including several matters involving telecommunications products. My resume is attached as Appendix A. It describes my qualifications, my publications, and my speeches over the past ten years, including those in the intellectual property area, as well as any testimony I have given.

D. Compensation

10. Analysis Group is compensated at the rate of \$460 per hour for the analysis I have conducted and any testimony I may give. Some of the work has been performed by others at Analysis Group working under my direction with hourly billing rates ranging from \$175 to \$370. My compensation is not contingent on my findings, testimony rendered or on the outcome of this litigation.

E. Documents Considered

11. In undertaking my analysis, I, or others working under my direction, have considered information from the following sources, each of which is typically relied upon by experts in my field.

- Documents provided by TruePosition and Andrew through the discovery process, including:
 - Financial documents;
 - Marketing materials; and
 - Proposals for sale to STC and others;
- Deposition testimony of personnel from TruePosition and Andrew;

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- Legal filings in the case;
 - Relevant publicly-available information, such as web site information;
 - Conversations with TruePosition personnel, including:
 - Frederic Beckley, *Senior Vice President and General Counsel*, 9/22/06 and 11/20/06;
 - Michael Hoppman, *Chief Financial Officer*, 9/22/06 and 11/20/06;
 - David McHoul, *Director, Sales Operations*, 9/22/06 and 11/20/06; and
 - Joseph Sheehan, *President and Chief Operating Officer*, 11/20/06 and 11/29/06.
12. In addition, I have also relied upon my professional judgment and expertise, gathered during many years of involvement in intellectual property matters. A complete list of the documents I have reviewed or relied upon is listed in Appendix B. My conclusions are based on the materials I have reviewed to date, and are subject to revision based on any additional facts, evidence, testimony and/or documents that may come to light in these proceedings.

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II. BACKGROUND

A. Parties-in-Suit

1. TruePosition, Inc.

13. Based in Pennsylvania, TruePosition, Inc. ("TruePosition") was established in 1992 to develop location systems and services for the wireless industry.¹¹ Today, TruePosition supplies location determination equipment and technology to wireless carriers and applications providers.¹² TruePosition's network-based location technology offers customers "an integrated platform of hardware, software, and services that calculates, manages, and distributes location information."¹³ Today, TruePosition is a subsidiary of Liberty Media Corporation, a \$25 billion communications and technology conglomerate with businesses in the U.S., Europe, South America, and Asia.¹⁴
14. TruePosition's primary services include location-based emergency services based on Uplink Time Difference of Arrival (U-TDOA) technology. In particular, TruePosition provides FCC E911 Phase-II-compliant locating services in urban, rural, and suburban communities through use of a patented system that pinpoints a caller's location through use of signals received at cellular operator base stations.¹⁵ In addition, TruePosition

¹¹ See "Reply to Request for Proposal, Location-Based Services (LBS) Platform, Executive Summary, December 2004."

¹² Liberty Media Holding Corp., SEC Form S-4, p. B-3-1 (filed March 15, 2006).

¹³ "North American Location-based Service Markets," (7918-65), p. 5-21, Frost & Sullivan (2003).

¹⁴ See "Reply to Request for Proposal, Location-Based Services (LBS) Platform, Executive Summary, December 2004."

¹⁵ "U.S. E9-1-1 Market Insight," (6847-63), p. 1-8, Frost & Sullivan (2003).

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offers commercial location solutions for corporate, entertainment, and wireless applications.¹⁶

15. TruePosition's wireless network equipment is installed with major infrastructure vendors in a variety of radio-frequency (RF) environments.¹⁷ The company's technology is compatible with multiple RF environments, including Time Division Multiple Access (TDMA), Advanced Mobile Phone Service (AMPS), Code Division Multiple Access (CDMA), and Global System Mobile (GSM).¹⁸
16. As shown in Exhibit 2, TruePosition achieved net revenues in 2005 from its sales and support activities of \$118.7 million and operating income of negative \$29.0 million. Virtually all of TruePosition's reported revenues in 2003, 2004, and 2005 were derived from its business with Cingular Wireless.¹⁹ Over this period, TruePosition has also made sales to T-Mobile, but the revenue has not yet been recognized on a GAAP basis.²⁰
2. **Andrew Corporation**
17. Andrew Corporation ("Andrew") was founded in 1937. It was incorporated in 1987 under Delaware laws, but retains its headquarters in Illinois. Andrew sells products based on RF technology that are used in wireless network infrastructure; voice, data,

¹⁶ *Ibid.*

¹⁷ "Reply to Request for Proposal, Location-Based Services (LBS) Platform, Executive Summary, December 2004."

¹⁸ Liberty Media Holding Corp., SEC Form S-4, pp. A-10 (filed March 15, 2006) and "U.S. E9-1-1 Market Insight," (6847-63), p. 1-9, Frost & Sullivan (2003). *See also* "North American Location-based Services Markets," (7918-65), p. 5-22, Frost & Sullivan (2003).

¹⁹ Liberty Media Holding Corp., SEC Form S-4, pp. A-9 (filed March 15, 2006).

²⁰ Revenue from T-Mobile has been deferred pending delivery of certain items. Liberty Media Holding Corp., SEC Form S-4, pp. A-9-A-10 (filed March 15, 2006).

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video and internet services; and applications for microwave and satellite communications.²¹

18. In July 2003, Andrew completed its acquisition of and merger with Allen Telecom, Inc., a global provider of wireless infrastructure equipment. In fiscal 2004, the stock-for-stock transaction was valued at \$495 million, \$43 million²² of which was allocated to settle patent infringement litigation filed by TruePosition against Allen Telecom prior to its acquisition by Andrew.²³
19. As Exhibit 3 shows, in fiscal year 2005 Andrew earned \$2.0 billion in revenues and \$77.5 million in operating profits, and in fiscal year 2006 the company earned \$2.1 billion and \$83.3 million in revenues and operating profits, respectively. Until recently, Andrew operated five business segments, which were established in 2005: Antenna and Cable Products, Base Station Subsystems, Network Solutions, Wireless Innovations, and Satellite Communications.²⁴

²¹ Andrew Corp. 2005 SEC Form 10-K, p. 3.

²² In 2004, Andrew reached an agreement with TruePosition, Inc. to settle patent infringement litigation filed against Allen Telecom, Inc. on December 11, 2001 (prior to the July 2003 acquisition by Andrew.) As part of this settlement, the company agreed to make cash payments with a present value of \$34.6 million and issued \$8.5 million worth of warrants, which allow TruePosition to purchase one million shares of the company's common stock for \$17.70 for up to four years. TruePosition and Andrew "also agreed to cross-license geolocation-related patents and to provide Andrew with the opportunity to manufacture certain geolocation hardware for TruePosition through October 2006," "Andrew Corporation and TruePosition Reach Litigation Settlement," <http://www.andrew.com/prcssroom/pressreleases/English/4977.aspx> (9/13/06) and Andrew's 2005 SEC Form 10-K, p. 45.

²³ Andrew Corp. 2005 SEC Form 10-K, pp. 22, 29, 45-48. *See also* "Andrew to Acquire Allen in \$500 Million Stock-For-Stock Transaction," <http://www.andrew.com/pressroom/pressreleases/English/4683.aspx> (9/13/06) and "Andrew Time Line," http://www.andrew.com/about/time_zone.aspx (9/13/06).

²⁴ Prior to fiscal year 2005, Andrew reported only two operating segments: Wireless Infrastructure and Satellite Communications. *See* Andrew Corp. 2005 SEC Form 10-K, pp. 3-4.

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20. Andrew's Network Solutions segment covered geolocation and location-based services (including software and equipment used to locate wireless E-911 callers); spectrum management; network optimization and inventory management; and advanced data collection for the wireless infrastructure industry.²⁵ In fiscal year 2005, Andrew's Network Solutions segment contributed revenues of \$157.4 million (8 percent of the company's overall product sales) and \$61.1 million in operating profits.²⁶ The vast majority (97 percent) of Andrew's Network Solutions sales occurred in the Americas.²⁷ In Exhibits 4 and 5, I show the detailed profit and loss statements for what were the Network Solutions Group and Geo Business Unit, respectively.

REDACTED**B. The Patent-In-Suit**

21. TruePosition has alleged that Andrew infringes TruePosition's '144 Patent.²⁹ The '144 Patent issued on July 5, 1994 and is entitled "Cellular Telephone Location System." The patent describes systems and methods for locating cellular telephones operating in analog and digital cellular telephone systems. Generally, I understand that the claims-at-issue relate to systems and methods of locating cellular telephones and mobile devices by

²⁵ Andrew Corp. 2005 SEC Form 10-K, pp. 3, 7, 10 and Andrew Corp. 2005 Annual Report, pp. 6-7. Geolocation systems are manufactured in Forest, Virginia.

²⁶ Andrew does not allocate costs that benefit more than one operating segment. For example, \$134 million in operating losses were not allocated in fiscal year 2005 (see Exhibit 3). Andrew Corp. 2005 SEC Form 10-K, pp. 27, 64-66 and Andrew Corp. 2005 Annual Report, p. 3.

²⁷ Andrew Corp. 2005 Annual Report, pp. 6-7.

²⁸ **REDACTED**

²⁹ TruePosition's Second Amended Complaint for Patent Infringement (May 30, 2006).

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using Uplink Time Difference of Arrival ("U-TDOA") technology on transmissions by the mobile devices over control channels. I further understand that using U-TDOA in this way does not require modification of the mobile devices or that they be in use for voice communications or calls at the time the telephones are being located.³⁰

C. The Products-At-Issue

22. The products-at-issue are location systems used to locate mobile devices in a cellular network. These systems consist of a variety of hardware and software components that are designed to work within a carrier's existing cellular network. TruePosition's trade name for its location systems is FinderTM ("Finder") and Andrew's is GeometrixTM ("Geometrix").³¹

23. As of December 2004, TruePosition's Finder system covered over

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November 2006, TruePosition had shipped and deployed over

2005 and 2006,

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The Finder system uses patented U-TDOA, and in some cases angle of arrival (AOA) technology, that enables mobile wireless service providers to calculate the

³⁰ U.S. Patent No. 5,327,144.

³¹ Deposition of Joseph Kennedy, Jr., 10/17/06, Vol. I., pp. 21-23.

³² "Reply to Request for Proposal, Location-Based Services (LBS) Platform, Executive Summary, December 2004," "Proposal for Deployment of the Finder System for Safety and Security Applications, Prepared for Qatar Telecom (Q-Tel)," April 13, 2006, p. 2.

³³ TPI-E0017654, p. 4.

³⁴ See, TPI-E0017173

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at slide 19. TPI-E0017181

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exact location of wireless devices and forward this information in real time to application software.³⁵

24. TruePosition's Finder system has embodied the patented technology at least since version 7.0 was commercially released in the second quarter of 2003. Version 5.0 also used the '144 patent, but this capability was available on a demonstration basis only in version 6.0.³⁶
25. According to Andrew, Geometrix is FCC E911-compliant and can accurately locate mobile devices in a variety of environments. Geometrix was first deployed in 2001 and, in 2003 according to Andrew, began commercial operation as the first location service to meet the high accuracy FCC mandate for E911 public safety requirements. Geometrix can include a variety of location technologies, including Enhanced CID (E-CID), A-GPS, U-TDOA, and Matrix, and supports multiple RF environments, such as GSM, CDMA, and TDMA.³⁷ It has also been integrated with radio access technology from equipment providers such as Ericsson, Nokia, Motorola, Lucent, and Nortel.³⁸
26. TruePosition has accused Andrew's Geometrix System (as modified after the conclusion of the prior litigation between Allen/Andrew and TruePosition to locate mobile devices on a control channel) of unlawfully practicing the patent-in-suit (the "accused

³⁵ Liberty Media Holding Corp., SEC Form S-4, p. A-10 (filed March 15, 2006).

³⁶ Deposition of Michael Hoppman, 11/15/06, [ROUGH, pp. 11-13]

³⁷ AND_EF0015990, <http://www.andrew.com/products/geometrix/capabilities.aspx> (9/13/06), and <http://www.andrew.com/products/Geometrix> (9/13/06).

³⁸ PX-193 and PX-201.

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products").³⁹ In particular, I understand that TruePosition has accused Andrew's proposal and sale to STC of infringing the '144 patent.⁴⁰ To date, Andrew has been awarded portions of its kingdom-wide proposal to STC.

received a contract for Phase I and a commitment for Phase

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27. A kingdom-wide rollout to STC, as contemplated in Andrew's proposal, dated December 9, 2004, would involve

At that time, Andrew also

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³⁹ TruePosition's Second Amended Complaint for Patent Infringement (May 30, 2006).

⁴⁰ TruePosition's Second Amended Complaint for Patent Infringement (May 30, 2006). *See also*, Andrew Corp., SEC Form 10-K, p. 61.

⁴¹ PX-345 (AND008259) and Deposition of Gary Brown, 11/7/06, Vol. I, pp. 14-15, 38-39; PX-86 and Deposition of James McDaniel, Jr., 9/29/06, pp. 152-153, 159-160.

⁴² PX-345 (AND008259), PX-349, and Deposition of Gary Brown, 11/7/06, Vol. I, p.14-15, 37-42, 67; PX-142, PX-144, and PX-146 and Deposition of Randy Wynn, 10/10/06, pp. 149-153.

⁴³ Gary Brown, Andrew's Group Finance Director, Network Solutions, explains that revenue recognition for Phases I and II is being delayed relative to Andrew's expectations contained in the documents. PX-349, PX-355, PX-357 and Deposition of Gary Brown pp. 16, 55-58, 60-67, 75-76, 103-106, and 111-116.

⁴⁴ AND_EF0013076.xls, Scenario #3 and Deposition of Gary Brown, 11/7/06, Vol. I, pp. 129-130. TruePosition's kingdom-wide proposal contemplates

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STCRFP_FinalPricing_12.07.04.xls, at 2.6.1.3.

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submitted a bid to cover the major cities only.

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28. In addition to the STC sale, I understand that Andrew's proposal and sale to Q-Tel is also accused of infringing the patent-at-issue. As mentioned above, my review of the available information indicates that there is evidence

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D. Location Equipment and Services ("LES") Technology

29. The LES market is comprised of multiple wireless location technologies, typically categorized as either network-based or handset-based.⁵⁰ In addition, a variety of factors are taken into consideration when choosing an LES technology, including accuracy, cost,

⁴⁵ AND_EF0013076.xls, Scenario #6 and Deposition of Gary Brown, 11/7/06, Vol. I, pp. 129-130. TruePosition's major city proposal contemplates:

REDACTED See STCRFP_FinalPricing_12.07.04.xls, at 2.6.1.6.

⁴⁶ PX-26, PX-252.

⁴⁷ PX-109 and Proposal for Deployment of the Finder System for Safety and Security Applications, Prepared for Qatar Telecom (Q-Tel), April 13, 2006.

⁴⁸ PX-252 and Deposition of Gary Brown, 11/7/06, Vol. I, pp. 105-107.

⁴⁹ PX-357 and Deposition of Gary Brown, 11/7/06, Vol. I, pp. 117-118.

⁵⁰ Network-based technologies allow all network subscribers to utilize services, but costs fall heavily on the carrier because all modifications and upgrades are made at the network level. Costs to the provider are lower for handset-based technologies, but because users must upgrade handsets to access services, these technologies tend to have slower market penetration. See "U.S. Location-based Service (LBS) Markets - Defining the Enterprise Opportunity," (F134-65), p. 2-8, Frost & Sullivan (2005).

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universal access, flexibility, versatility, coverage, yield, and latency.⁵¹ While there are various wireless location solutions, I discuss four primary technologies: Cell ID⁵²/Enhanced Cell ID, U-TDOA, A-GPS, and E-OTD.⁵³ These LES technologies vary along a number of dimensions including whether they are handset or network based.⁵⁴

30. Cell ID (CID) is a network-based solution and the most basic positioning technology available. It measures signal strength and relies on the ability of mobile networks to identify the cell sector in which a handset connects to the network. It is a cost-effective short-term solution for operators who do not mind inconsistent accuracy. Enhanced Cell ID (E-CID), producing accuracies around 250 meters in indoor and urban environments and 500 to 1,000 meters in suburban areas and less than 5,000 meters in rural environments, improves upon the accuracy of CID, but still is less accurate than other technologies such as U-TDOA.⁵⁵

⁵¹ "An Examination of U-TDOA and Other Wireless Location Technologies: Their Evolution and Their Impact on Today's Wireless Market," TruePosition 2004 White Paper, pp. 4-5, 10. *See also* "U.S. Location-based Service (LBS) Markets - Defining the Enterprise Opportunity," (F134-65), p. 2-8, Frost & Sullivan (2005) and "The Location-Based Services Renaissance: A New Formula for Success," Capgemini, February 2005, pp. 6-7.

⁵² Cell ID is also referred to as Cell Global Identity (CGI) and can be coupled with Timing Advance (TA) information.

⁵³ "U.S. Location-based Service (LBS) Markets - Defining the Enterprise Opportunity," (F134-65), pp. 2-8 to 2-14, Frost & Sullivan (2005) and "The Location-Based Services Renaissance: A New Formula for Success," Capgemini, February 2005, p. 14. *See also*, "U.S. Poised to Capitalize on Location Services," TruePosition 2004 White Paper, p. 4.

⁵⁴ *See* TPI-E0001902, p. 74 and "An Examination of U-TDOA and Other Wireless Location Technologies, Their Evolution and Their Impact on Today's Wireless Market," p. 6.

⁵⁵ "U.S. Location-based Service (LBS) Markets - Defining the Enterprise Opportunity," (F134-65), pp. 2-8 to 2-14, Frost & Sullivan (2005), "The Evolution and Comparison of TruePosition Location Capabilities, Prepared for Saudi Telecom," p. 3, and "An Examination of U-TDOA and Other Wireless Location Technologies, Their Evolution and Their Impact on Today's Wireless Market," p. 6.

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31. Uplink Time Difference of Arrival (U-TDOA) is a network-based high performance solution that uses triangulation to measure the time of arrival data from the terminal to three or more nearby base stations. The accuracy is superior to CID and E-CID, and the cost is typically higher. U-TDOA offers urban and suburban accuracy ranges of about 50 meters and rural accuracy of about 80 meters.⁵⁶ Relative to A-GPS, U-TDOA offers higher accuracy in urban environments and scores higher than A-GPS in all environments in terms of yield, providing "locations in more than 99 percent of all cases."⁵⁷ U-TDOA also has advantages when it comes to flexibility and scalability – as operators can test, deploy, and deliver services over select markets.
32. Assisted Global Positioning System (A-GPS) is a handset-based location solution that enhances service in areas with a weak GPS signal, such as indoors and urban areas. A-GPS improves upon GPS by gathering assistance data and providing faster and more accurate service.⁵⁸ Relative to the other technologies, A-GPS offers the best rural (about 30 meters) and suburban (about 40 meters) accuracies, but in urban and indoor environments it is less accurate than U-TDOA. In "open sky" unblocked environments,

⁵⁶ "An Examination of U-TDOA and Other Wireless Location Technologies, Their Evolution and Their Impact on Today's Wireless Market," pp. 5-6.

⁵⁷ "An Examination of U-TDOA and Other Wireless Location Technologies, Their Evolution and Their Impact on Today's Wireless Market," p. 6.

⁵⁸ GPS uses GPS chips which triangulate from the GPS satellites' signals; it is the most commonly known location technology. A-GPS uses a combination of mobile devices, GPS servers, and GPS satellites to determine the position of a device; it is the communication between a fixed server in the network and the mobile phone that lends to the nomenclature "Assisted GPS." See TPI-E0001903, pp. 7-8 and "Wireless Location Solutions for Homeland Security" (TruePosition, 2005).

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A-GPS can achieve accuracies as low as 10 meters.⁵⁹ Two key advantages that A-GPS solutions offer are compatibility across all network technologies and cost effectiveness relative to other technologies.⁶⁰

33. Enhanced Time Difference of Arrival (E-OTD) is a handset-based solution that enhances location accuracy and (unlike GPS) is not reliant on a line of sight to the terminal. However, it is uncertain whether this technology is capable of meeting FCC Phase II accuracy requirements, and deployment of the technology is expensive and cumbersome because it requires major infrastructure changes. It appears that based on accuracy and implementation problems, carriers such as T-Mobile who were once considering this technology have abandoned it.⁶¹ I have seen no evidence of any successful E-OTD implementations.
34. Each technology has its own advantages and limitations, and “[n]o single locating technology can meet the needs of all services or applications in all environments.”⁶² As such, there can be advantages to a hybrid approach, combining different technologies. For example, combining U-TDOA with A-GPS offers a more complete location positioning solution in terms of accuracy and quality by taking advantage of U-TDOA’s indoor and urban capabilities and A-GPS’ outdoor benefits.

⁵⁹ TPI-0001903, pp. 7-8 and “Wireless Location Solutions for Homeland Security” (TruePosition, 2005).

⁶⁰ “U.S. Location-based Service (LBS) Markets – Defining the Enterprise Opportunity,” (F134-65), pp. 2-11 to 2-12, Frost & Sullivan (2005).

⁶¹ Deposition of Michael Hoppman, 5/22/03, pp. 176-177.

⁶² “Mobile Position Determining Technologies (Why Multiple Technologies Are Necessary),” <http://www.andrew.com/products/geometrix/mpdt/> (9/13/06).

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35. Various providers offer some of these technologies. For example, Ericsson, TruePosition, Nokia, Alcatel, and Polaris Wireless offer E-CID.⁶³ However, for certain technologies such as U-TDOA, there are fewer providers. Only two firms currently offer U-TDOA solutions: Andrew and TruePosition.⁶⁴ For example, in its Geolocation Business Review presented in July 2005, Andrew showed that its only competitor with the ability to address the RF Footprint for Network Solutions was TruePosition.⁶⁵ Similarly, TruePosition considers Andrew its only competitor in the U-TDOA space.⁶⁶

E. Location Technology and Services Marketplace

36. The location technology and services marketplace addresses the needs of mobile users, wireless operators, and government agencies and the like by providing a broad range of equipment, software, and/or services that generate location information and/or integrate contextual data with the location information.⁶⁷ Below I discuss the primary segments within the location technology and services market: (1) E-911, (2) Safety and Security and (3) Other Commercial Applications such as Location-Based Services ("LBS").

E-911

37. Enhanced 911 (E-911) refers to 1996 FCC legislation mandating that U.S. mobile operators implement technologies that enable the location of phones used during emergencies. This legislation stimulated the development of and investment in location

⁶³ TPI-E0001903, p. 13.

⁶⁴ TPI-E0001903, pp. 12-13, 37.

⁶⁵ PX-411. *See also* Deposition of Michael Hoppman, 11/15/06, pp. 60-61 and TPI-E0001903, pp. 12-14, 37-39.

⁶⁶ Deposition of Michael Hoppman, 11/15/06, [ROUGH, p. 64]. *See also* TPI-E0001903.

⁶⁷ "U.S. Location-based Service (LBS) Markets - Defining the Enterprise Opportunity," (F134-65), p. 2-2, Frost & Sullivan (2005).

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measurement technologies and wireless location infrastructure and applications.⁶⁸ To fulfill this mandate, U-TDOA technology was selected by Tier I carriers such as T-Mobile, Cingular and AT&T Wireless. Sprint and Verizon have chosen handset solutions for E-911 applications.⁶⁹

38. Of the largest U.S. carriers, Cingular and T-Mobile chose TruePosition's system while AT&T Wireless⁷⁰ selected Andrew's system to meet E-911. With Cingular's acquisition of AT&T Wireless, however, TruePosition has begun replacing Andrew equipment purchased by AT&T Wireless with its own equipment.⁷¹ In addition, Andrew and TruePosition have provided E-911 solutions to Tier II and Tier III carriers.⁷²
39. It appears that since many of the U.S. carriers have already purchased E-911 solutions, this segment of the marketplace is not projected to offer significant future revenues or growth opportunities.⁷³ Since at least 2003, Tier I carriers have worked to satisfy the E-911 FCC mandate and, having reached maturity and advanced stages of compliance,

⁶⁸ "U.S. Location-based Service (LBS) Markets – Defining the Enterprise Opportunity," (F134-65), p. 2-4, Frost & Sullivan (2005) and "The Location-Based Services Renaissance: A New Formula for Success," Capgemini, February 2005, p. 14. Also, according to TruePosition, "Deployment of E-911 has reached the Phase II compliance stage of the FCC mandate." As of December 31, 2005, carriers were required by the FCC to put the infrastructure in place for precise location of a wireless caller. See "U.S. Poised to Capitalize on Location Services," TruePosition 2004 White Paper, p. 1.

⁶⁹ Deposition of Michael Hoppman, 5/22/03, pp. 118-119.

⁷⁰ Cingular has acquired AT&T Wireless, which lends uncertainty to this account for Andrew. TruePosition Five-Year Business Plan, Prepared for Liberty Media Corporation, May 2005, p. 12.

⁷¹ TPI-E0017654, p. 4. See also TruePosition Five-Year Business Plan, Prepared for Liberty Media Corporation, May 2005, p. 5.

⁷² TruePosition Five-Year Business Plan, Prepared for Liberty Media Corporation, May 2005, p. 12. Tier III carriers include Viaero, iWireless and Westlink. See TPI-E0012289, TruePosition, Inc. Shareholders Meeting: December 16, 2004 at slide 4.

⁷³ See, for example, Deposition of Michael Hoppman, 5/22/03, pp. 67-68 and 74-75, describing revenues beyond E-911 as essential.

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TruePosition projects that after 2005, “spending in support of E-911 will sharply decline.”⁷⁴ It does appear, however that some avenues for growth and margin enhancement remain open with Tier III providers, and outside the U.S.⁷⁵

Safety and Security

40. The Government and Middle East sectors are viewed as the next areas of opportunity in the location equipment and services marketplace. To compete in these sectors, vendors will need to focus on safety and security applications, as these features are the customers’ primary interests.⁷⁶ Given the recent focus on national security and anti-terrorism solutions, the Middle East is seen as the key geographic segment for these applications.⁷⁷ Latin America, where “economic kidnapping” of foreign nationals is prevalent, is another expected growth area for safety and security solutions.⁷⁸
41. U-TDOA, which is more accurate than E-CID and more accurate than A-GPS in congested areas, is particularly well-suited for security based applications because it works well indoors and offers high yields in all environments.⁷⁹ Joseph Sheehan, TruePosition’s President and COO, testified that alternative forms of location-based technology (other than U-TDOA) can provide “very coarse or inaccurate position measurements” and that U-TDOA is the most accurate location technology available for

⁷⁴ TPI-E0001903, p. 5 and TPI-E0001902, p. 10.

⁷⁵ Ibid. See also Deposition of Michael Hoppman, 5/22/03, pp. 117-120.

⁷⁶ TPI-E0001902, p. 15.

⁷⁷ TPI-E0001903, p. 19 and TPI-E0001902, pp. 10, 12.

⁷⁸ “The Location-Based Services Renaissance: A New Formula for Success,” Capgemini, February 2005, p. 5.

⁷⁹ “An Examination of U-TDOA and Other Wireless Location Technologies: Their Evolution and Their Impact on Today’s Wireless Market,” p. 6, and Deposition of Michael Hoppman, 11/15/06, [ROUGH p. 59-62.]

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the urban market.⁸⁰ Joseph Kennedy, Jr., Andrew's former Vice President of Business Development of its Network Solutions Group, confirmed that U-TDOA has advantages over other technologies, particularly for security applications.⁸¹

42. In addition, network-based solutions are important for security applications because with handset-based solutions, such as A-GPS, location determination can be prevented through alteration of the handset to avoid detection.⁸² The requirement that the handset contain a GPS chip means that A-GPS may not work with all devices used on the network; in particular it does not work with legacy handsets.⁸³
43. According to Michael Hoppman, TruePosition's CFO, "in places where security is a problem, such as South America, the Middle East, and parts of Asia ... where people are interested in safety and security they want to be able to locate any phone at any time they want, and TDOA is perfect for that."⁸⁴ Andrew's website indicates that U-TDOA is the "optimum location technology" for security applications.⁸⁵ As mentioned above, there are currently only two providers of U-TDOA systems: TruePosition and Andrew.⁸⁶ As such, the safety and security segment of the location equipment and services marketplace is a two-supplier market.

Other Commercial Applications

⁸⁰ Deposition of Joseph Sheehan, 10/19/06, pp. 81, 124.

⁸¹ Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(b)(6) – Vol. 2, pp. 51-52.

⁸² <http://www.andrew.com/products/geometrix/mpdt/advantages-disadvan.aspx> (11/30/06).

⁸³ Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(b)(6) – Vol. 2, pp. 49-50.

⁸⁴ Deposition of Michael Hoppman, 11/15/06, [ROUGH, pp. 61-62]

⁸⁵ http://www.andrew.com/products/geometrix/loc-serv-apps/app_loc_tech_svcs.aspx (11/30/06).

⁸⁶ Deposition of Michael Hoppman, 11/15/06, pp. 60-61 and TPI-E0001903, pp. 12-14, 37-39.

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44. In addition to E-911 and safety and security, providers of location equipment and services are poised to address a variety of commercial enterprise needs, such as asset tracking, friend and family tracking, and roadside assistance. Location equipment and services eventually may also be used for convenience applications, such as traffic, weather, and gaming applications.⁸⁷ Applications of such systems and services are often referred to as Location-Based Services ("LBS"). In the near term, commercial enterprise solutions are expected to contribute to the adoption of LBS. Similar to safety and security applications, commercial enterprise applications tend to require higher accuracy needs and offer higher revenue potential than convenience applications.⁸⁸
45. According to a 2005 Frost & Sullivan report, "[t]he driving force behind successful commercial location based service deployments will be accuracy and compatibility."⁸⁹ With such a wide-range of applications and needs, various LBS technologies offer different advantages, while a hybrid approach may offer the most complete solution.⁹⁰ However, U-TDOA will likely be one of the most successful technologies given the market's demand for accuracy, flexibility and scalability, three of U-TDOA's key advantages.⁹¹

⁸⁷ "The Location-Based Services Renaissance: A New Formula for Success," Capgemini, February 2005, p. 5.

⁸⁸ *Ibid.*

⁸⁹ U.S. Location-based Service (LBS) Markets – Defining the Enterprise Opportunity, F134-65, Frost & Sullivan, 2005, p. 2-5.

⁹⁰ *Ibid.*

⁹¹ U.S. Location-based Service (LBS) Markets – Defining the Enterprise Opportunity, F134-65, Frost & Sullivan, 2005, pp. 2-5, 2-8 to 2-11; "The Location-Based Services Renaissance: A New Formula for Success," Capgemini, February 2005, p. 7; "An Examination of U-TDOA and Other Wireless Location Technologies: Their Evolution and Their Impact on Today's Wireless Market," TruePosition 2004 White

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F. The STC Bid

46. On February 21, 2004, STC submitted an RFP which outlined six scenarios for which it was requesting bids. Three of these scenarios required U-TDOA functionality: Scenario 3 required a location platform to support only U-TDOA position methods kingdom-wide, Scenario 4 required U-TDOA and A-GPS methods that would operate in a dual manner kingdom-wide, and Scenario 6 required a mix of systems, but in particular U-TDOA and A-GPS for the cities of Makkah, Madina, Jeddah, Riyadh and Dammam.⁹² The other three scenarios required less precise systems, such as Cell ID or more expensive systems such as Angle of Arrival (AOA).⁹³ While other vendors may have been able to submit proposals for some of the other scenarios, only TruePosition and Andrew were able to compete for the scenarios that required U-TDOA.⁹⁴
47. The evidence indicates that TruePosition's Finder system compares favorably to Andrew's Geometrix system on some important dimensions. First, TruePosition had already installed in 2004 a test system in Riyadh at the request of STC, which was operating to the satisfaction of STC.⁹⁵ Second, there is evidence in the record that TruePosition's products were viewed by STC to be technologically superior to those of Andrew. According to Andrew e-mail correspondence in early 2005, the STC

Paper, pp. 4-5, 10.

⁹² TPI-E000359, pp. 6-7.

⁹³ *Ibid.*

⁹⁴ TPI-E0001903, pp. 13-14.

⁹⁵ Letter from Paul Czamecki (TruePosition) to Dr. Zyed Al-Etaibi, July 21, 2005, Deposition of Joseph Sheehan, 10/19/06, pp. 93, 97-98 and TPI-E0012312, p. 33; TPI-E0012295, p. 51; TPI-E0002206; TPI-E0002258.

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engineering team had recommended

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84.88%.⁹⁶ Third, a TruePosition document outlining a direct comparison of the two competitors' systems notes that from a capacity perspective, TruePosition's "link monitoring nodes supports complete auto-discovery of all link level and call level parameters, full security and commercial LBS support" while "[t]he Andrew AMU does not support auto-discovery." Furthermore, Andrew's signal collection method "requires 20% to 25% more LMUs to achieve the same performance as TruePosition" and TruePosition's system offers a "10% - 20% improvement in accuracy over the Andrew method."⁹⁷ Finally, it also appears that STC was very interested in the capability of locating mobile devices in GPRS mode. According to Joseph Kennedy,

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48. As a result of the technical superiority of TruePosition's product, it appears that

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In early 2005, after becoming aware that the STC engineering team had recommended TruePosition's product over Andrew's, Mohamed Eissa, Andrew's Vice President of Business Development for Wireless Network Solutions, sent an internal e-mail indicating that

⁹⁶ PX-32, TPI-E0000539.

⁹⁷ TPI-E000529. *See also* Deposition of Robert Anderson, 9/21/06, pp. 135-141, 146-147. *See also* Anderson Exhibit 13, pp. 14-16.

⁹⁸ PX-33, Deposition of Joseph Kennedy, 11/9/06, Third Rule – 30(b)(6) – pp. 39-41, and Deposition of Mohamed Eissa, 10/31/06, pp. 103-112.

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49. On December 7, 2004, TruePosition submitted its final proposal to STC's RFP with a bid for

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50. Andrew followed suit two days later, issuing a bid for

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51. On May 2, 2005, TruePosition

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⁹⁹ PX-32.

¹⁰⁰ Deposition of Terry Garner, 9/27/06, pp. 72-76.

¹⁰¹ This kingdom-wide bids (Scenario 3 and 4) assumed a total

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¹⁰² See STCRFP_FinalPricing_12.07.04.xls, at 2.6.1.3, at 2.6.1.4, and at 2.6.1.6. [Note: The U.S. Dollar values in TruePosition's worksheets do not include the "Total Cost - Spare Parts" in the "Total Cost of Project" line. The numbers cited here have been adjusted to include the value of spare parts.] See also Exhibit 6.

¹⁰³ AND_EF0013076.xls, Scenarios #3, #4, and #6, and Deposition of Gary Brown, 11/7/06, Vol. I, pp. 129-130. "GSM E7 RFP Bill of Quantity Updated Prepared for Saudi Telecom," and STC_PricingUpdate_05.02.05_TP.xls.

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52. Throughout the first half of 2005, the record suggests that TruePosition was under the impression that it would be awarded the STC contract.¹⁰⁵ For example:

- In an email dated January 9, 2005, Paul Czarniecki wrote, “Dr. Zyed, Head of Wireless-STC, told us (Khalid Amayreh of Nour and me) that, while not final, he intends to award the U-TDOA business to TruePosition for the cities of Riyadh, Dammam and Jeddah to start.”¹⁰⁶
- In mid-2005, TruePosition thought that its competition with Andrew for the STC contract was over, when Mike McGoldrick stated in an email, “The Ericsson and/or Andrew lobbying is ‘officially’ over. STC has decided to accept TDOA from NOUR/TruePosition. All last minute technical questions have been answered to the satisfaction of STC and all the necessary documentation required by ‘STC Contracts Department’ for the Location portion of the Tender have been signed by and forwarded to the VP of Contracts.”¹⁰⁷
- In an email dated July 28, 2005 Nour’s Khalid Al Amayreh wrote to Joe Sheehan of TruePosition, “...We have received word from STC that they intent [*sic*] to award Nour/TruePosition the contract for wireless location in the Kingdom within 3 weeks. Other Wireless Operators in the region will be following the lead of STC.”¹⁰⁸

¹⁰⁴ Deposition of Joseph Sheehan, 11/17/06, [ROUGH, pp. 28-29] and STC_PricingUpdate_05.02.05_TP.xls.

¹⁰⁵ Deposition of Joseph Sheehan, 10/19/06, pp. 94-98.

¹⁰⁶ TPI-E0002618.

¹⁰⁷ TPI-E000617.

¹⁰⁸ TPI-E0002248.

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- Michael Hoppman of TruePosition confirmed that he was confident as of August 2005 that TruePosition would win the STC contract.¹⁰⁹

53. Nonetheless, in late 2005/early 2006, Andrew was awarded a contract with STC. As mentioned previously, to date Andrew has been awarded a contract for Phase I and received a commitment for Phase II of the STC bid, respectively. For Phase I of the STC project,

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54. In October 2006, TruePosition met with STC for the first time since the contract award to Andrew to determine whether the two companies could potentially do business together in the future. TruePosition was invited to submit a

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In November 2006, TruePosition submitted a proposal to STC.

¹⁰⁹ Deposition of Michael Hoppman, 11/15/06, [ROUGH, p. 44].

¹¹⁰ James McDaniel, Jr., Andrew's Director of International Programs, defines a tamed as "an indication of intent to spend a level of funding by the customer." See Deposition of James McDaniel, Jr., 9/29/06, p. 117.

¹¹¹ PX-86 and Deposition of James McDaniel, Jr., 9/29/06, pp. 152-153 and 159-160, and AND_EF0000317_Andrew-UPL-UTDOA-GSM-VAS-FINAL-DEC20-2005.xls.

¹¹² PX-142 and PX-144.

¹¹³ PX-411 and Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(b)(6) – Vol. 2, pp. 35-36.

¹¹⁴ See Deposition of Gary Brown, 11/7/06, Vol. I, p. 116.

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STC has indicated that it is interested in doing business with TruePosition, but has not yet committed to anything.¹¹⁶

III. FRAMEWORK FOR THE DAMAGES ANALYSIS

55. In analyzing damages for patent infringement, the injured party is entitled to be placed in the financial position it would have enjoyed had infringement not occurred. In some cases, an appropriate measure of damages is lost profits. Lost profits typically represent the additional sales and profits that the patent holder would have made had there been no infringement.
56. For infringing sales on which lost profits are not appropriate, a damaged party is entitled to at least a reasonable royalty. A reasonable royalty represents the payment or stream of payments that the accused infringer should have paid for using the patent holder's patented technology. Usually, the amount of a reasonable royalty payment is computed initially by making reference to what the two parties would have negotiated and agreed upon at the point of first accused infringement.
57. As discussed further in the sections below, I have concluded that lost profits are an appropriate form of compensation in this matter for all of Andrew's accused sales for which evidence is currently available. Therefore, I have not provided a reasonable royalty opinion. In the event that additional evidence becomes available that suggests that reasonable royalty damages may be an appropriate form of compensation in this

¹¹⁵ TPI-E0017654, TPI-E0017655. -

¹¹⁶ Deposition of Joseph Sheehan, 11/17/06, [ROUGH, pp. 77-93].

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matter for some or all of Andrew's accused sales, I will supplement my opinions to take this into account.

IV. LOST PROFITS

A. Recovery Standards

1. Panduit Test

58. A claimant's eligibility for lost profits in patent cases historically has been governed by the test established in *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.* 575 F.2d 1152 (6th Cir. 1978). The test requires the injured claimant (here, TruePosition) to show proof of the following four factors:

- the demand for the patented product;
- the absence of acceptable non-infringing alternatives;
- the manufacturing and marketing capacity to exploit the demand; and
- the amount of profit the patent holder would have made.

2. BIC Leisure Test

59. In its decision in *Bic Leisure Products, Inc. v. Windsurfing Int'l, Inc.*, 1 F.3d 1214 (Fed. Cir. 1993), the Court of Appeals for the Federal Circuit ("CAFC") further clarified the Panduit test. To recover lost profits, the claimant must show that "but-for" the infringement, it would have made additional sales. Although the BIC Leisure test does not appear to replace the Panduit test, it does emphasize that the injured party must prove what would have transpired in the "but-for" world, not what theoretically could have transpired. The case points out that if the claimant's products are in the same "market" as those of the infringer, the claimant may be entitled to a pro rata share equal to its historical share of the relevant "market" of acceptable substitutes.

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3. *Micro Chemical v. Lextron*

60. The Panduit test has been supplemented and clarified in a number of subsequent court cases. One such variation on the Panduit test is the two-supplier market test as set forth in the court's decision in *Micro Chemical, Inc. v. Lextron, Inc.*¹¹⁷ The Federal Circuit has described this test as follows:

Admittedly, this court's precedent has not reconciled completely the two-supplier [market] test with the Panduit test. Nevertheless, that precedent does provide the necessary framework for application of the two-supplier market test ... [T]his court [has] stated:

In the two-supplier market, it is reasonable to assume, provided the patent owner has the manufacturing and marketing capabilities, that it would have made the infringer's sales. In these instances, the Panduit test is usually straightforward and dispositive.¹¹⁸

61. Thus, once a patentee has shown that the relevant market contains only two suppliers, it remains only to show 1) its manufacturing and marketing capacity sufficient to make the sales that were diverted to the infringer, and 2) the amount of profit that it would have made from these diverted sales. In essence, the two-supplier market test collapses the first two Panduit factors into one "two suppliers in the relevant market" factor.¹¹⁹ Nevertheless, below, I discuss each Panduit factor separately.

¹¹⁷ *Micro Chemical, Inc. v. Lextron, Inc.*, 318 F.3d 1119, 1124 (Fed. Cir. 2003).

¹¹⁸ *Ibid.*

¹¹⁹ *Ibid.*

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B. Lost Profits Analysis

1. Demand for the Patented Product

62. In analyzing demand for the patented product, it is appropriate to examine the level of demand for the patented products as well as the extent to which that demand is driven by the features of the patent-at-issue. Demand for the patented product is evidenced by substantial sales of products embodying the patented technology and the critical importance of the technology in driving demand for the accused sales to STC and Q-Tel. An examination of TruePosition and Andrew actual and projected sales data indicates that there has been considerable demand and there is expected to be continued demand for products practicing the '144 patent.

63. According to Michael Hoppman, TruePosition's Chief Financial Officer, products incorporating the '144 patent were commercially available at least as early as Q2 2003, with Release 7.0.¹²⁰ Over the period 2004 through Q1 2006, TruePosition has sold over

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64. TruePosition also expected that there would be considerable demand for products practicing the '144 patent, as evidenced by various and projected sales data indicating that the Finder system was expected to generate significant revenues for TruePosition.

¹²⁰ Deposition of Michael Hoppman, 11/15/06, [ROUGH, pp. 11-12]. Prior to late 2002, TruePosition's 5.0 Release, which was also commercially available, located mobile devices almost exclusively on the control channel. However, Release 6.0, which was developed to satisfy TruePosition's customer base that wanted a traffic channel LMU, was both a traffic channel and a control channel or voice channel box.

¹²¹ Revenues are reported on a shipped basis. See TPI-E0017173, pp. 18-19, TPI-E0001887, pp. 6-7, 13; [Note: 2004 annual data is projected as of 12/1/04]. See also TPI-E0012289, pp. 11-12.

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For example, a March 2004 business plan for TruePosition Finder services projected that revenue would surpass **REDACTED**

A little over a year later, in May 2005, TruePosition had an even more optimistic short term outlook for hardware and software revenues and high expectations for maintenance revenues, projecting that Finder hardware and software revenues would reach

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66. There is also some evidence that Andrew and TruePosition expected considerable demand by potential customers in the Middle East other than STC and Q-Tel for U-

¹²² Finder Business Plan.doc (TPI-E0012301), p. 5.

¹²³ Business Plan Slides_05.02.05.ppt (TPI-E0001902), pp. 2, 16.

¹²⁴ PX-414, at Section 6.1.

¹²⁵ Deposition of Joseph Kennedy, Jr., 11/9/06, Vol. 2, pp. 58-62-63.

¹²⁶ PX-349 and Deposition of Gary Brown, 11/7/06, Vol. I, pp. 14-15, 37-42, 67; PX-86 and Deposition of James McDaniel, Jr., 9/29/06, pp. 152-153, 159-160; PX-142, PX-144, and PX-146 and Deposition of Randy Wynn, 10/10/06, pp. 149-153.

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TDOA systems embodying the patented technology. For example, Andrew valued potential business with **REDACTED**

As well, in a May 2006, TruePosition presentation to its Board of Directors, TruePosition valued the market potential of various Middle East operators. At that time, in addition to

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67. I have also considered the role of the patented technology in contributing to the demand for products embodying the patent-at-issue. My review of evidence provided by TruePosition and Andrew indicates that the '144 patented technology plays a critical role in determining the demand for U-TDOA systems, especially for safety and security applications such as required by the Middle East business generally and the bids to STC and Q-Tel, specifically. It is my understanding that the ability to locate mobile devices using U-TDOA on control channel transmissions is the most commercially viable way of locating devices in "idle mode" (i.e., not being used for voice communications or calls).

¹²⁷ See Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(b)(6) – Vol. 2., pp. 26-28 and 36-38, PX-359, and PX-415. See also Deposition of Gary Brown, 11/7/06., pp. 124-125 and Deposition of Joseph Kennedy, Jr., 11/9/06, Vol. 2, pp. 75-78. In the case of Mobily, Andrew was even modeling projected revenues into some of its financial spreadsheets. See PX-356, PX-357, and Deposition of Gary Brown, 11/7/09, pp. 108-110.

¹²⁸ TPI-E0017175, pp.15-16.

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68. The ability to win these contracts in the Middle East appears to be dependent on the ability to locate mobile devices in idle mode. For example, TruePosition's five year business plan

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69. An Andrew Network Solutions Group presentation dated July 22, 2005 states:

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¹²⁹ TruePosition Five-Year Business Plan, Prepared for Liberty Media Corporation, May 2005, p. 19.

¹³⁰ PX-83 remarked as PX-411.

¹³¹ See Deposition of James McDaniel, Jr., 9/29/06, pp. 144-148. Joseph Kennedy, Jr., corroborates this point explaining that the majority of opportunities that Andrew was pursuing were in the Middle East and the primary requirement there was security. See Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(b)(6) – Vol. 2, p. 34.

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70. Andrew considered the value proposition of U-TDOA in an internal memo and

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71. My review of the evidence indicates that, with respect to Andrew's STC and Qatar proposals, the patented technology was an important product feature in qualifying the Geometrix product for consideration. As STC stated in its RFP specifications: "The Tenderer should ensure that the positioning information is obtained without informing a mobile holder."¹³³ Mohamed Eissa, Andrew's Vice President of Business Development for Wireless Network Solutions.

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Joseph Kennedy, Jr., Andrew's former

¹³² PX-241 and Deposition of Joseph Kennedy, Jr., 10/17/06, Vol. I, pp. 75-77.

¹³³ Response to Request for Proposal, Prepared for Nour Communications in Response to Saudi Telecom Company RFP GSME7, December 2004, p. 21 (TPI-E0001420). *See also* Deposition of Joseph Kennedy, Jr., 10/16/06, pp. 44-46.

¹³⁴ Deposition of Mohamed Eissa, 10/31/06, pp. 93-99 and Ex. 313.

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Vice President of Business Development of its Network Solutions Group, confirmed that

72. In addition, in March 2005, Mohamed Eissa, Andrew's Vice President of Business Development for Wireless Network Solutions, wrote the following to Terry Garner, Andrew's Network Solutions Group President:

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73. With respect to Q-Tel, According to David McHoul, TruePosition's Director of Sales Operations, Q-Tel was in the market for a safety and security system.¹³⁷ TruePosition's proposal includes security features such as emergency call location, group profiling and tracking, smart proximity, and bulk location (which implements U-TDOA to identify and locate mobile phones with high-accuracy.)¹³⁸

74. In addition, Andrew's bid to Q-Tel stated that it would provide two key features:

¹³⁵ Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(b)(6) – Vol.2, pp. 39-41.
¹³⁶ PX-412.

¹³⁷ Deposition of David McHoul, 11/16/06, [ROUGH, p. 13.]

¹³⁸ Proposal for Deployment of the Finder System for Safety and Security Applications, Prepared for Qatar Telecom (Q-Tel), April 13, 2006, pp. 13-14.

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75. My review of the evidence indicates that the security features enabled by the patented technology are critical factors driving demand for the Geometrix system with respect to sales to STC and Q-Tel. Such evidence, considered in combination with the magnitude of sales of the accused systems and TruePosition's systems that practice the '144 patent, illustrates demand for the patented product.

2. Availability of Acceptable Non-Infringing Alternatives

76. My review of the evidence indicates that there are no acceptable non-infringing alternatives. As detailed previously, the evidence shows that the marketplace for U-TDOA safety and security solutions is a two-supplier marketplace. Not surprisingly then, the evidence shows that TruePosition and Andrew were the only two bidders to provide U-TDOA services to STC and Q-Tel.¹⁴⁰

77. With respect to the STC bid, the evidence indicates that TruePosition and Andrew were the only two bidders for the U-TDOA portions of the RFP.¹⁴¹ According to the deposition testimony of Terry Garner, Andrew's Network Solutions Group President:

Q. Was there -- was it your understanding that there were two bidders for this STC project for providing a location-based services

¹³⁹ Exhibit 109, AND_EF123763

¹⁴⁰ PX-26 and Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(6)(6) – Vol. 2., pp. 47-48.

¹⁴¹ Deposition of Joseph Kennedy, Jr., 11/9/06, Third Rule – 30(6)(6) – Vol. 2., pp. 47-48. *See also*, PX-32.

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solution?

A. Yes.

Q. And what were the two bidders?

A. Andrew and TruePosition.

Q. But you don't know of any other bidders, apart from TruePosition and Andrew?

A. That's correct.¹⁴²

78. My review of the evidence indicates that Andrew and TruePosition were the only bidders to provide U-TDOA services to Q-Tel. I have seen no evidence that other products offered by other competitors were under consideration by Q-Tel to fulfill their UTDOA requirements.

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3. Manufacturing and Marketing Capacity to Exploit Demand

79. I have determined that TruePosition had the required manufacturing capacity to meet the additional demand contemplated by my lost profits analysis. I base this conclusion on an

¹⁴² Deposition of Terry Garner, 9/27/06, pp. 72-73.

¹⁴³ PX-26.

¹⁴⁴ PX-252.

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analysis of TruePosition's production process and capacity as well as its historical ability to meet increases in demand.

80. I have also concluded that TruePosition had marketing capacity sufficient to make the STC and Q-Tel lost sales. In particular, TruePosition participated in the proposal process for both of these contracts throughout the relevant periods.

a. Manufacturing Capacity

81. TruePosition develops and produces the software used with its Finder systems. According to conversations with TruePosition personnel, the software associated with the STC and Q-Tel bids had already been developed. Thus, the award of these contracts would not have required the development of additional software.

82. With respect to the hardware components, TruePosition relies on an outside contractor,

Based on conversations with TruePosition personnel, I understand that
REDACTED has historically operated below capacity and could easily have produced the additional hardware contemplated by the bids to STC and Q-Tel. Moreover, it is my understanding that the parts used in hardware assembly are not specialized parts and could be readily available from a number of vendors, including those currently used by TruePosition.

¹⁴⁵ Conversations with TruePosition personnel. See also Deposition of Michael Hoppman, 5/22/03, pp. 79-80, 201-202.

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83. For local installation of the Finder system hardware and software associated with the STC and Q-Tel bids, TruePosition planned to rely on a local vendor.¹⁴⁶ With respect to both deals, TruePosition had contracted with Nour Communications Company to fulfill obligations regarding installation, testing, front-line support and on-site maintenance.¹⁴⁷

84. An analysis of TruePosition's historical ability to meet the demand for its Finder systems shows that TruePosition is projected to have manufactured, sold, shipped, and installed its Finder system on over REDACTED

But-for the alleged infringement, TruePosition would have had to make, sell and install location systems for approximately

REDACTED

Expressed as a percentage of historical annual deployments, my lost profits analysis contemplates a maximum annual increase in sales volume of approximately REDACTED percent.

¹⁴⁶ TruePosition historically has done limited installation work, usually relying instead on contract manufacturers. Although the physical installation of equipment is done by independent contractors, other installation, design work and project management was done by TruePosition employees. See Deposition of Michael Hoppman, 5/22/03, p. 81. See also Deposition of Joseph Sheehan, 11/17/06, [ROUGH, pp. 28-32], 58-62 and Deposition of Michael Hoppman, 11/15/06, [ROUGH, pp. 87-88.]

¹⁴⁷ For STC, see TPI-E0002054; For Q-Tel, see TPI-E0017138, p. 16.

¹⁴⁸ In 2005 and 2006, (projected) LMUs were shipped, respectively. See TPI-E0017173, p. 19, TPI-E0017181, and conversations with TruePosition personnel, 11/20/06.

¹⁴⁹ The maximum year is 2007 and includes REDACTED See Exhibits 7 and 13.

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85. Furthermore, with respect to the STC deal, it is my understanding that TruePosition placed over [REDACTED] for this project into inventory prior to the proposal.¹⁵⁰ Thus, some of the required capacity could have been fulfilled with existing inventory.

b. Marketing Capacity

86. As mentioned above, my lost profits analysis includes only TruePosition's lost sales to STC and Q-Tel. TruePosition has demonstrated its ability to compete for sales to both of these customers. In fact, TruePosition submitted proposals to both STC and Q-Tel for the specific sales at issue.
87. With respect to STC, TruePosition was a respondent to STC's request for proposal for a U-TDOA system.¹⁵¹ My review of the evidence indicates that TruePosition submitted bids and corresponded with STC regarding this particular bid over at least the period December 2004 through September 2005.¹⁵² There is evidence that TruePosition was an active participant in the bidding up until the time that Andrew was provided with a tamed, or notification of STC's intent to award the contract.¹⁵³ With respect to Q-Tel, the evidence shows that TruePosition submitted various proposals to Q-Tel in April and May 2006.¹⁵⁴

¹⁵⁰ TPI-E 0017173, p.26.

¹⁵¹ TPI-E0000359, p. 6; TPI-E0001420.

¹⁵² E.g., Response to Request for Proposal, Prepared for Nour Communications in Response to Saudi Telecom Company RFP GSME7, December 2004 (TPI-E0001420); The Evolution and Comparison of TruePosition Location Capabilities, Prepared for Saudi Telecom (STC), 9/15/05; 173-STC0505DM-1.pdf.

¹⁵³ See, for example, TPI-E0002618; DX-9 (TPI-E0002248); TPI-E000617.

¹⁵⁴ "Proposal for Deployment of the Finder System for Safety and Security Applications, Prepared for Qatar Telecom (Q-Tel), April 13, 2006," QatarPricing_04.13.06.xls, and QatarPricing_05.12.06.xls.